# Interagency Assessment of Potential Health Effects of Oxygenated Gasoline

Presented at the First Meeting of the Blue-Ribbon Panel on the Use of MTBE and Other Oxygenates in Gasoline

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Interagency Assessment of Potential Health Effects of Oxygenated Gasoline

- Conducted for the White House Office of Science and Technology Policy, at the request of Assistant Administrator for Air and Radiation, EPA
- Original purpose was to examine whether evidence from recent health studies of oxygenated gasoline and *acute illness* warranted a reconsideration by EPA of potential health risks of the oxygenated gasoline program, *prior to the 1995-96 winter*.
- Contributors were 15 scientists from CDC, NIEHS, and EPA.
- Focus was primarily on inhalation exposures to MTBE.

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*Sequence of Reports*

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| 9/95 | First draft of interagency report presented to Interagency Steering Committee and to OSTP (10/95 external peer review draft) |
| 2/96 | NSTC publication of “Interagency Assessment of Potential Health Risks Associated with Oxygenated Gasoline” |
| 4/96 | Health Effects Institute report, “The Potential Health Effects of Oxygenates Added to Gasoline” |
| 6/96 | NRC report, “Toxicological and Performance Aspects of Oxygenated Motor Vehicle Fuels” |
| 6/97 | NSTC publication of Interagency Assessment of Oxygenated Fuels (Chapter 4) |

Interagency Assessment of Potential Health Effects of Oxygenated Gasoline

*Major Conclusions*

Exposures:

- Only inhalation exposures examined
- Limited number of studies conducted
- For the general population, refueling poses the highest potential for acute exposures
- Occupational exposures are highest for workers involved in manufacturing or transport of MTBE
- Estimates of high-end exposure levels to MTBE involve significant assumptions and are highly uncertain

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*Major Conclusions*

Metabolism:

- MTBE rapidly absorbed and eliminated after inhalation (humans and rats) or oral (rat) exposure
- Major metabolites are TBA and formaldehyde
- In humans, MTBE and TBA may accumulate in biological fluids after repeated exposure

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*Major Conclusions*

Acute Health Effects:

- Emphasis on limited nature of the available data
- Greater attention should be given to the potential for increased symptoms among workers exposed to high levels of MTBE
- At lower concentrations, evidence suggests that most people do not experience adverse health effects
- Anecdotal reports of acute symptoms among some individuals cannot be explained or dismissed
- Further examination of possible predisposing factors might be useful

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*Major Conclusions*

Chronic Health Effects Other Than Cancer:

- Neurotoxic, developmental, or reproductive effects not likely to occur at environmental or occupational exposures to MTBE

- Evidence from studies in rats indicate a neuroactive effect that could hinder performance during periods of high exposure

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*Major Conclusions*

Cancer:

- MTBE is carcinogenic in rats and mice at multiple organ sites after oral or inhalation exposure
- Mechanisms by which MTBE causes cancer in animals are not well understood -

    genotoxicity tests have generally negative results

    kidney tumors in rats not simply a consequence of alpha-2u-globulin accumulation

- TBA and formaldehyde, primary metabolites of MTBE, are also carcinogenic in animals
- No studies of carcinogenicity of MTBE in humans

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*Major Conclusions*

Cancer Risk Estimates:

- Sufficient evidence to indicate that MTBE is an animal carcinogen and has human hazard potential
- Estimates of human risk from MTBE contain large uncertainties in both human exposure and cancer potency
- Important question is whether cancer risk from oxygenated gasoline is significantly different from that of conventional gasoline - need more data on relative ambient concentration of air toxics present in emissions from both types of gasoline